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Remarks

Claims 1, 4-13, 15 and 16 are pending in the application.

Claims 1, 7, 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,104,515 to Cao (hereinafter Cao) in view of Ramaswami, Optical Networks: A Practical Perspective (hereinafter Ramaswami).

Claims 10, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and further in view of United States Patent No. 6,005,702 to Suzuki et al.(hereinafter Suzuki).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 6,097,525 to Ono et al. (hereinafter Ono).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of US Published Application No. 2003/0002121 by Miyamoto et al. (hereinafter Miyamoto).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 6,724,829 by Tzukerman et al. (hereinafter Tzukerman).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 5,745,613 Fukuchi.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 4,847,477 to Smith (hereinafter "Smith").

Each of the various rejections and objections are overcome by various amendments and arguments that are presented.

Entry of this Amendment is proper under 37 CFR § 1.116 since the amendment: (a) places the application in condition for allowance for the reasons discussed herein; (b) does not raise any new issue requiring further search and/or consideration since the amendments amplify issues previously discussed throughout prosecution; (c) satisfies a requirement of form asserted in the previous Office Action; (d) does not present any additional claims without canceling a corresponding number of finally rejected claims; or

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(e) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of the amendment is thus respectfully requested.

Any amendments to any claim for reasons other than as expressly recited herein as being for the purpose of distinguishing such claim from known prior art are not being made with an intent to change in any way the literal scope of such claims or the range of equivalents for such claims. They are being made simply to present language that is better in conformance with the form requirements of Title 35 of the United States Code or is simply clearer and easier to understand than the originally presented language. Any amendments to any claim expressly made in order to distinguish such claim from known prior art are being made only with an intent to change the literal scope of such claim in the most minimal way, i.e., to just avoid the prior art in a way that leaves the claim novel and not obvious in view of the cited prior art, and no equivalent of any subject matter remaining in the claim is intended to be surrendered.

Also, since a dependent claim inherently includes the recitations of the claim or chain of claims from which it depends, it is submitted that the scope and content of any dependent claims that have been herein rewritten in independent form is exactly the same as the scope and content of those claims prior to having been rewritten in independent form. That is, although by convention such rewritten claims are labeled herein as having been "amended," it is submitted that only the format, and not the content, of these claims has been changed. This is true whether a dependent claim has been rewritten to expressly include the limitations of those claims on which it formerly depended or whether an independent claim has been rewriting to include the limitations of claims that previously depended from it. Thus, by such rewriting no equivalent of any subject matter of the original dependent claim is intended to be surrendered. If the Examiner is of a different view, he is respectfully requested to so indicate.

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**Rejection Under 35 U.S.C. 103(a)****Claims 1, 7, 8 and 16**

Claims 1, 7, 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,104,515 to Cao (hereinafter Cao) in view of Ramaswami, Optical Networks: A Practical Perspective (hereinafter Ramaswami). The rejection is traversed.

Independent claims 1 and 16 have been amended to clarify Applicants' invention. Specifically, claim 1 has been amended to clarify that the apparatus is adapted for use in transmission in an optical communication system, and that the modulator may be one of a PSK, DPSK or QPSK modulator. Claim 16 has been amended in similar manner. No new matter has been added.

Applicants submit that Cao does not teach any apparatus or modulator for use in transmission, or that the apparatus or modulator 26 in Fig. 1 performs any PSK, DPSK or QPSK encoding on an optical signal.

Instead, as shown in Cao's Fig. 1, the optical tap 20 "is coupled to receive an optical data signal from a remote transmitter" (col. 4, lines 58-60), and the phase modulator 26 is driven by a "sinusoidal output clock signal at a predetermined frequency which is the bit rate of the optical signal received by the PMD compensation arrangement 10" (see col. 5, lines 52-56; emphasis added); while the clock signal is provided by the clock recovery circuit 34, which "is basically a filter that filters out a signal at a predetermined frequency such as 10 GHz, which corresponds to the data bit rate" (col. 5, lines 49-52; emphasis added).

That is, Cao's apparatus is used for PMD compensation of a received signal, and not for signal transmission, and the sinusoidal clock signal driving the phase modulator does not contain any data (since the signal has been filtered out). Thus, the phase modulator in Cao does not generate any PSK, DPSK or QPSK signal.

Furthermore, Fig. 4.1 of Ramaswami only shows various signal formats, namely, NRZ, RZ and short pulse formats, that can be used with on-off keying (OOK) modulation (see first paragraph in Section 4.1.1 relating to Fig. 4.1). On-off keying, which is also

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known as amplitude shift keying (ASK) modulation, modulates the amplitude, as opposed to the phase of a signal. As such, none of the signal formats in Ramaswami's Fig. 4.1 teaches or suggests combining RZ with any of the phase shift keying (PSK), differential phase shift keying (DPSK) or quadrature phase shift keying (QPSK) formats, as recited in Applicants' claim 1.

Thus, Ramaswami fails to bridge the substantial gap between Cao and Applicants' invention as claimed in at least independent claim 1.

Finally, Applicants submit that, even if combined, Cao, together with Ramaswami, would have resulted in RZ pulses having phase modulation that is driven by a sinusoidal clock that contains no data.

As such, the combined teaching of Cao and Ramaswami fails to teach or suggest RZ data pulses with one of PSK, DPSK or QPSK encoding, in which the phase modulation is done in accordance with an input digital data stream (rather than Cao's data-less clock), as provided in Applicants' claim 1.

Since independent claim 16 includes relevant limitations similar to those of claim 1, it is respectfully submitted that this claim is also patentable for at least the reasons discussed above with respect to claim 1.

Finally, since claims 7 and 8 depend from claim 1 and recite additional limitations therefrom, these claims are also patentable for at least the reasons discussed above with respect to claim 1.

Therefore, Applicants' claims 1, 7, 8 and 16 are patentable under 35 U.S.C. 103(a) over Cao in view of Ramaswami. As such, the Examiner's rejection should be withdrawn.

#### **Claims 10, 11 and 15**

Claims 10, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and further in view of United States Patent No. 6,005,702 to Suzuki et al. (hereinafter "Suzuki").

Each ground of rejection applies only to dependent claims, and each is predicated on the validity of the rejection under 35 U.S.C. 103 given Cao in view of Ramaswami.

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Since the rejection under 35 U.S.C. 103 given Cao in view of Ramaswami has been overcome, as described hereinabove, and there is no argument put forth by the Office Action that Suzuki supplies that which is missing from Cao in view of Ramaswami to render the independent claims obvious, these grounds of rejection cannot be maintained.

Therefore, applicants' claims 10, 11 and 15 are patentable under 35 U.S.C. 103(a) over Cao in view of Ramaswami and in further view of Suzuki. As such, the Examiner's rejection should be withdrawn.

**Claims 4-6, 9, and 12-13**

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 6,097,525 to Ono et al. (hereinafter "Ono").

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of US Published Application No. 2003/0002121 by Miyamoto et al. (hereinafter "Miyamoto").

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 6,724,829 by Tzukerman et al. (hereinafter "Tzukerman").

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 5,745,613 Fukuchi (hereinafter "Fukuchi").

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao in view of Ramaswami and in further view of United States Patent No. 4,847,477 to Smith (hereinafter "Smith").

Each ground of rejection applies only to dependent claims, and each is predicated on the validity of the rejection under 35 U.S.C. 103 given Cao in view of Ramaswami. Since the rejection under 35 U.S.C. 103 given Cao in view of Ramaswami has been overcome, as described hereinabove, and there is no argument put forth by the Office Action that the additional references supply that which is missing from Cao in view of

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Ramaswami to render the independent claims obvious, these grounds of rejection cannot be maintained.

Therefore, Applicants' claims 4-6, 9 and 12-13 are patentable under 35 U.S.C. 103(a) over Cao in view of Ramaswami and further in view of the respective references of Suzuki, Ono, Miyamoto, Tzukerman, Fukuchi and Smith. As such, the Examiner's rejection should be withdrawn.

### Conclusion

It is respectfully submitted that the Office Action's rejections have been overcome and that this application is now in condition for allowance. Reconsideration and allowance are, therefore, respectfully solicited.

If, however, the Examiner still believes that there are unresolved issues, the Examiner is invited to call Eamon Wall at (732)530-9404 so that arrangements may be made to discuss and resolve any such issues.

Respectfully,

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